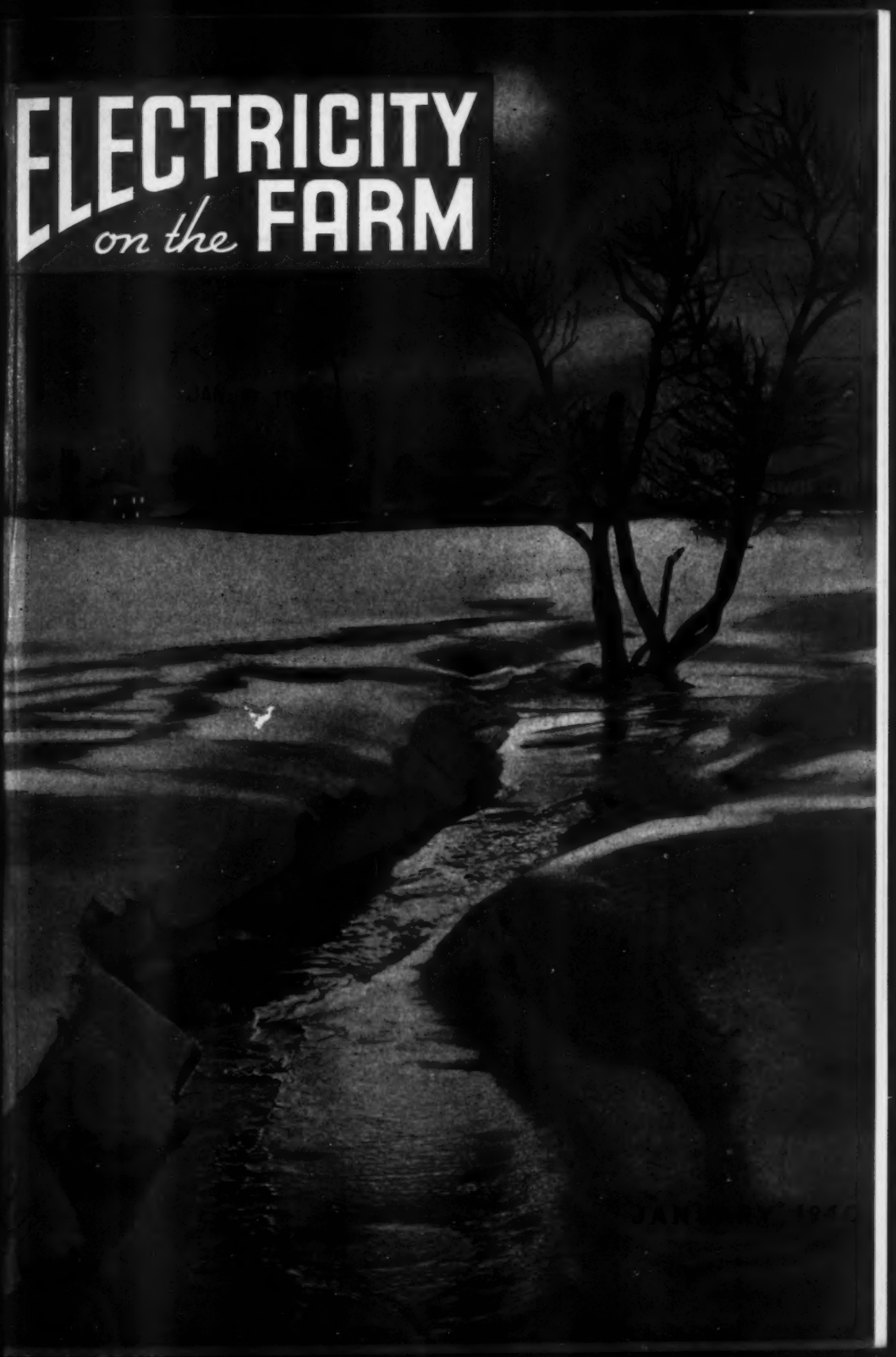
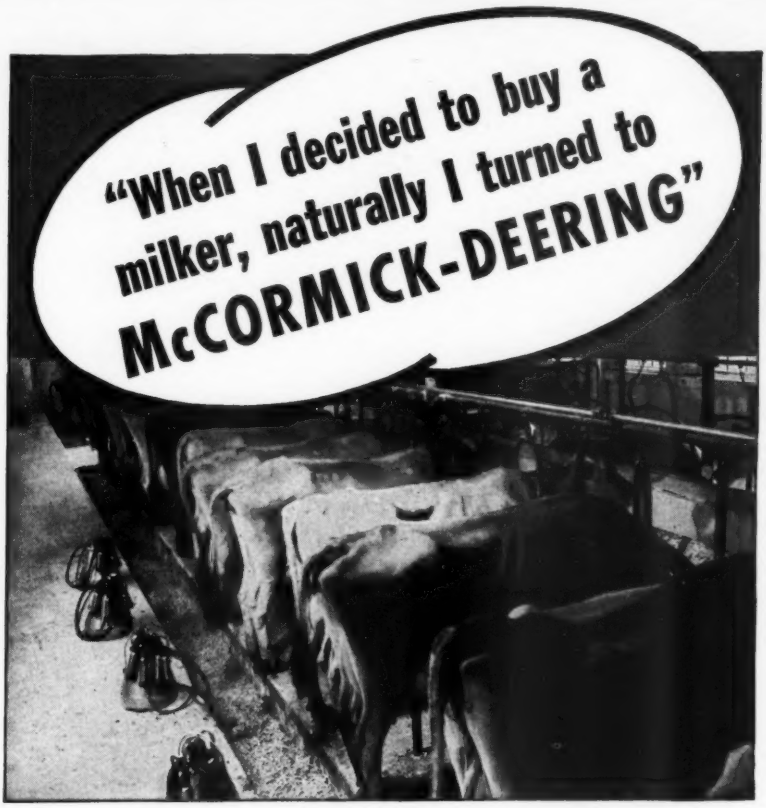
ELECTRICITY *on the* FARM





Take a Tip From Dairyman John Phillips, Wellsville, N. Y., When You Need Dairy Equipment

Four McCormick-Deering single-unit milkers handle the milking of 30 Jersey cows at the Weldonian Dairy, owned by John Phillips, Wellsville, N. Y. The dairy barn interior and milkers are shown above.

Mr. Phillips says of his McCormick-Deering Milker:

"For the past 30 years I have used nothing but International Harvester machinery on my farm. When I decided to buy a milker, naturally I turned to International Harvester with the feeling that they would incorporate all the fine qualities in their milker that they have in their other machinery. ***I looked at other milkers but failed to find any superior to the McCormick-Deering.***"

Take a tip from this successful operator when you buy milkers, cream separators, and milk coolers. The McCormick-Deering line includes pipe line and portable milkers in single and double units; a new streamlined, stainless steel cream separator in four sizes; and milk coolers in sizes from 2-can to 12-can capacity. See the International Harvester dealer for complete information.

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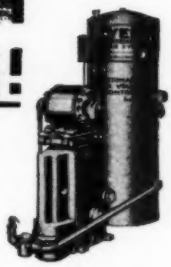

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Editor's Chat

DO YOU RUN WITH THE BALL?

During the football season recently closed, I had the privilege of seeing the Texas Aggies, Tennessee and Duke in action. All were superior teams,—winners. The most thrilling happening in those games was to see a runner, apparently boxed by the opposing team, twist, side step and speed up the field, weaving through or going over the tacklers. The more difficult it appeared, the more acclaim for the runner making the gain. Football is not all spectacular runs, nor all successful passes or long punts. Yardage is made by a continuing succession of tries against opposition, some of which fail. The games which bring out the biggest crowds are the ones where the opposition is strongest.

Have you ever seen a player in the backfield receive the ball from the center and stand and hold it waiting for a chance to pass or run, and then be smothered in his tracks by his opponents? To score points in the game of football, one must either kick, pass or run.

Life is a game!

Many of us attend the Farmer's Week program or the Short Course to get coaching on how to "play the game" better. We have faith in the coach. He tells us about plays he knows to be good ones. We see them demonstrated by some other player. Then, we hear the signals called; we receive the ball; and—*we fail to run*—. Downed in our tracks, or thrown for a loss. No "college letter," no public applause, and no score in the cash book is given for that kind of play. The fellow who says, "Well, I've got the ball but I just can't get by those tacklers," just won't! He'll play on the scrub team or be kicked off the squad.

Have you ever read anything in ELECTRICITY ON THE FARM that gave you an idea on how to make progress for yourself?—Well, fullback! That's the signal. **Grab that ball and RUN!**

GOLDEN RULE

Down in Oklahoma, a power company has turned over a tenant farm to a community organization to see if it could work up a tenant-landlord compact which would enable the tenant to live decently, save the soil from depletion and washing away, and yield some return to the owner. The reasoning back of the proposal was that a power company serving a community cannot be prosperous in the long run unless the community is prosperous. Tenants frequently have little income and little hope. They are poor prospects for electric service.

On this particular farm, a three-way lease has been worked out: a lease with hope for the tenant, for the owner and for the State which values soil as a resource. The tenant must plow on contours, must turn under 10 acres of legumes for fertilizer each year, must clear brush from and seed 3 acres of woodland. He must farm under guidance of the Farm Security Administration from whom he borrowed working capital. He must keep daily records. He participates in the Federal agricultural adjustment program. He pays as rent 1/5 of cash truck crops, ¼ of the cotton raised and 1/3 of other crops. But here is where he gets the break. His lease runs for five years. The money for the landlord's share is put in escrow until the end of the year; and at the end of the year, if the tenant has plowed, cleared and planted or made other permanent improvements as specified, the landlord's share is given to the tenant and the owner gets his pay in increased value of the farm. Starting with a family of two children and total cash, owned and borrowed, of less than $400 for equipment and operating expense, this tenant had an increased worth of $733.90 in one year of operation. When I saw the farm in October, he had five head of dairy stock, a garden and chickens. There was pasture and stacked feed for the cows. The fields were contour-plowed and were not washing. Best of all, the family was happy. Oh yes! They are now using electricity. $2.70 worth a month.

"Do unto others as you would be done by." When other rules fail, it often works. Even though our ultimate motives are selfish,—and most of them are—it's a good rule. The hopeless tenant was helped. Now he is a self-reliant citizen who is helping the community, the landlord and the power company.

A HAPPY NEW YEAR!

George Kable

January, 1940 **ELECTRICITY ON THE FARM** **Vol. 13, No. 1**

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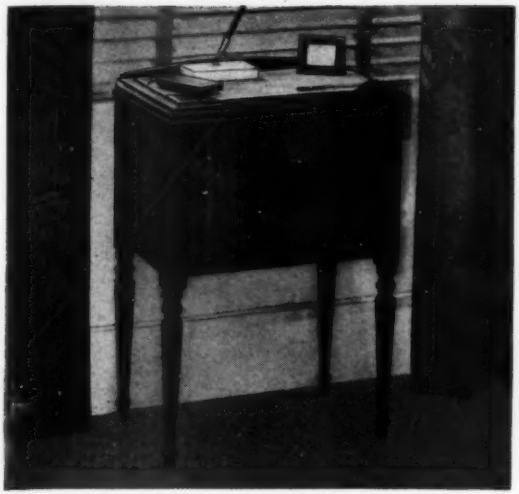


Singer Electric Miracles

•

The Budget Sewing Machine

that's a lovely desk, besides.

IT'S COMPACT AND SWIFT—and sturdy enough to stitch heavy grain sacks and overalls! Large capacity round bobbin. Sewing light. Handsome walnut cabinet. *Costs only a few cents a day. Ask about Singer's trade-in offer.*

•

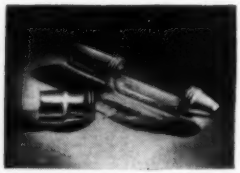
The Singer Cleaning Group

that does everything from cleaning rugs to spraying paint!

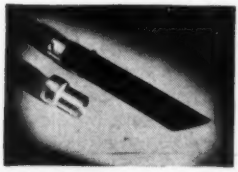
The Singer Hand Vacuum cleans upholstery, stair carpets, hard-to-reach places. And with these *extra* accessories (shown right) you can accomplish even more!

The Singer Floor Vacuum represents a big advance in floor cleaning. 6 new features make your work easier and more thorough.

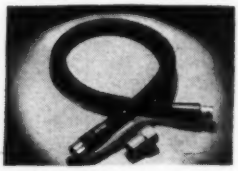
Sprayer—for spraying paint, liquid wax, insecticides.



Glass Container—used with moth-repellent crystals or aromatic deodorizing crystals.

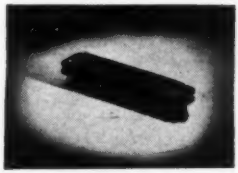


Rubber Nozzle—for cleaning hard-to-reach places, or folds of upholstery.



Extension Hose—for reaching high places. Fits on all other accessories.

Bristle Brush—attaches to nozzle for cleaning mouldings, draperies, etc.



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When they come by the dozen, you need a pig brooder to save them.

PIGS IS PIGS

And It Is Cheaper and More Profitable to Save Them With an Electric Pig Brooder Than to Raise More with an Extra Sow.

By J. P. SCHAENZER
Agricultural Engineer,
Edison Electric Institute

IN 1932 members of the staff of Oregon State Agricultural College decided to construct a brooder designed exclusively for pig brooding. Their early efforts were spent in developing a hover with an underheat type of electric element.

Preliminary tests of the electric brooder with pigs farrowed in December and January seemed to indicate that larger litters were weaned than when none was used. The small pigs stayed under the hover to keep warm and fewer of them were crippled or killed by the sow. Perhaps due to the mild March weather of 1933, experiments with twelve sows and their litters did not show any advantage in the per cent of pigs raised (about 80) to eight weeks of age when using this equipment. Of real significance, however, those pigs raised with the brooders weighed an average of 29.5 pounds each at 56 days of age, and those not so raised, 25.2 pounds. This is an increase of 15 per cent in weight.

This Is an Idaho Pig Brooder

The sides are 18 inches high and the top is hinged at the back. The brooder is heated by a strip or space heater attached below a metal shield and reflector on the under side of the top. The location of the shield and strip heater are indicated by the dotted lines. A heavy wire screen is placed over the heater to protect it from the pigs. 150 watt heaters are suitable for mild climates; 250 watts for cold climates. Insulating board may be used on top and floor for additional protection.

Further experiments with electric pig brooders were carried on at the University of California during the springs of 1935, 1936 and 1937. During these three years the pig losses for the first ten days averaged 29 per cent in the regular farrowing pens where no supplementary heat was used. North Dakota Experiment Station reports a loss

Lamp Type Pig Brooder
Brooder with guard fence to keep sow away from lamp and wiring. After the pigs have nursed the first time, they should be placed under the hover. They learn quickly where to find warmth and protection.

of 30 per cent, and Nebraska records of 159 litters show that mature sows raised only 60 and young sows 76 per cent of the pigs farrowed.

For these same years underheat brooders were used on nineteen litters in California with a loss of only 15 per cent. A home-made hover equipped with an incandescent lamp of either 100 or 150 watts to furnish both heat and light was tested on thirteen litters. With this radiant type of pig brooder only 13 per cent of the pigs were lost. In other words, ten days' use of electric pig brooders reduced losses to about one-half.

Building the Pig Brooder

Hovers are built out of wood, triangular in shape so that they fit into a corner of the pig pen. The two sides are made of twelve-inch boards, three and one-half feet long, and nailed together at right angles. Lumber or insulating board may be used for the top. To give it strength a 2x4 is placed across the top of the front, leaving an entrance about eight inches high.

As a heating element, a white-enameled dome reflector, twelve or sixteen inches in diameter, should be installed with a 100- or 150-watt lamp. A hole one-half inch less in diameter than the reflector is cut in the center of the top and the reflector placed over it and fastened in place. A strong wire netting should be fastened to the underside of the hole to protect the lamp and reflector. The unit should be equipped with waterproof rubber cord for safety and durability.

The brooder should be fastened securely in the corner to prevent the sow from damaging it. A two-foot barrier of boards or planks placed above the front of the hover will help to protect it.

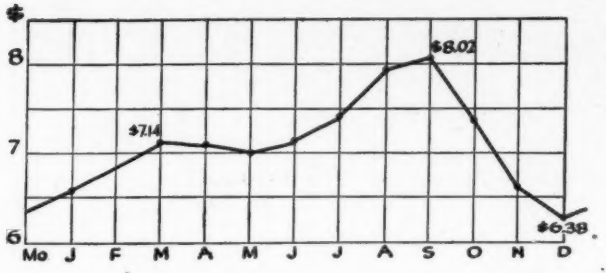
Experience has shown that it is advisable to place the sow in the pen in advance of farrowing time. The brooder should be started shortly before the arrival of the pigs. It will be necessary to place them under the hover by hand until they learn to go there by themselves. Blocking them in for several hours will help train them.

The electric bulb type heater has the advantage of supplying both heat and light, and it is an easy matter to reduce the heat output by installing a smaller size of lamp. With a 100-watt lamp, the energy consumption will amount to twenty-four kilowatt hours for each ten days of brooding with the lamp on continuously. Because of the short brooding period per litter, it is possible to use each hover several times throughout the farrowing season.

Pig Brooders Increase Hog Profits

Prices received by farmers for hogs per one hundred pounds range from a low of $6.38 in De-

Under Heat Pig Brooder
The brooder was developed in Indiana and tested at Purdue University. The thermostatically controlled heating element is housed in a galvanized, triangular pan which may be used under the pigs for underheat or above them for top heat. The heat is distributed over the floor or top. In comparative tests with lamp and ring (circular strip) heated types, the thermostatically controlled underheat unit used less than half as much electricity.



Average price of hogs per 100 pounds received by farmers by months, United States, 1928-37. Source: Bureau of Agricultural Economics; based on reports of special price reporters.

cember to $8.02 in September. A 200-pound hog sold in September will bring on an average $3.28 more than if marketed in December. Spring hogs are highest in March. These figures are ten-year averages, 1928-1937, published by the Bureau of Agricultural Economics, U. S. Department of Agriculture. The average prices for all months were:

January	$6.67	July	$7.50
February	6.88	August	7.91
March	7.14	September	8.02
April	7.06	October	7.33
May	7.00	November	6.69
June	7.08	December	6.38

Hogs sold during August or September must be farrowed in February or early March. In most sections of the country these are cold months. The mortality among young pigs is higher than the average. Warm quarters must be provided. The electric pig brooder can be of practical value. It will not only save a larger number of the pigs, but also enable the farmer to get them ready for the highest priced market of the year. As more pigs are raised per sow, it is also possible to reduce the cost of production by holding over less breeding stock. This may result in a substantial saving in labor, feed and shelter cost.

—I'm proud I am a farmer—

School Has Hotbed

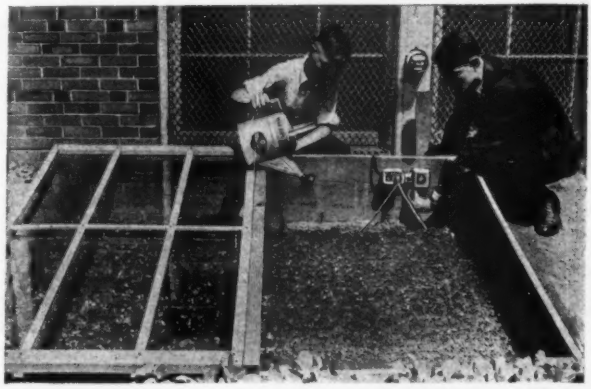
By MARY MARGARET LYNCH
Chatham, Pa.

FOR three years the boys of the agriculture department of the Quarryville, Pennsylvania, high school, have been buying and selling farm seeds cooperatively. The seeds are bought in bulk and packaged to fill orders from students and farmers. This seed service has been very successful, for it provides seeds of highest quality at low cost.

This year the boys decided to enlarge their service by raising seedling plants for sale at cost. Two small hot beds, each six feet square, were built in a sheltered place at the side of the school. The total cost of the two beds was approximately fifteen dollars. This included lumber for the beds, the seedling frames and the glass sash, all of which can be used again. One was a manure hot bed, the other was heated by electricity.

Cabbage, cauliflower, tomato plants were started. When these plants were taken out, celery seedlings were started. Spinach will be planted for the late summer and early fall. The cabbage and cauliflower plants were sold to the boys at ten cents a dozen and the tomato plants at a cent apiece.

Mr. William Fredd, instructor of vocational agriculture in the Quarryville school, estimates the operating cost of the electric hot bed as very slightly higher than taht of the manure bed. "But," he added, "those few cents difference in cost are more than justified when you find that the plants in the electric hot bed can be removed one whole week before those started in the other bed. This early maturing is especially important to truck farmers, who know that the first crops to appear on the market can command the best price."



William Fredd, agriculture instructor, and Clifford Boyd, student, caring for plants in the Quarryville High School electric hotbed.

"Ma sure does like her electric range — and she's tried them all."

The Lady is Seventy-Seven

By MARY SHOOP

THE early afternoon sun shone warmly through the car windows as I turned off the paved highway onto a dirt road which idled lazily through an orange grove. The fat orange trees fluttered their shiny leaves in the breeze, highlighting their brightly colored fruit which looked like Christmas tree decorations. The road ambled around a barn, scooted down a straight stretch, rounded a final turn and brought me to a modest frame farmhouse shaded by eucalyptus trees. In it lived the woman I had come to see—Mrs. R. A. Pickens, Rural Route Box 113, Norwalk, Calif., a grandmother who at the age of 77 had changed to electric cookery.

Crossing the neat lawn, I mounted the steps of the porch with its two comfortable rocking chairs and knocked at the screened door. It was opened by Mrs. Pickens, whose motherly face repeated the welcome her voice spoke in a soft southern dialect.

"I am sorry Pa had to go to town just before you came. I hope he'll be back before you leave. Well," she smiled, "I reckon you came to talk about my new electric range."

"I did," I replied. "It seemed unusual for you, a grandmother, to leave the cooking method you have used for years and take up something new."

"I've cooked in all kinds of ways, all right," Mrs. Pickens said. "When Pa and I were married in North Carolina, I went to housekeeping in a house with a wood stove. I was only sixteen years old. Pa and I had been childhood sweethearts, born and raised within a mile of each other. After we were married, we lived on our farm fifteen miles from Asheville for twenty-six years. I remember the woodbox for my old stove, and the job I used to have getting Pa and the hired man to keep it filled. On summer days the kitchen would be like a furnace. That was nothing like the nice cool kitchen I have now with my electric range!

"We moved to Idaho and lived on a farm, and we lived in Washington before coming to California about twelve years ago. We've lived on our two-acre farm here for eleven years. During my life I've cooked with wood, coal, oil, gas, and now with electricity. And I think my electric range is the best of them all."

"What do you like especially about it?" I asked.

"Well, there's its cleanliness," Mrs. Pickens answered. "When we bought the new electric range our kitchen was smoked up terribly from the stove we'd been using. We had it repainted and the walls are staying bright and clean because the electric range is so clean. As for scouring pots and pans—I don't do that any more. Electricity is just about as clean as the California sunshine we're all so proud of."

"Have you baked many things in the oven?"

"Yes, I do a lot of baking; and everything comes out fine. We like biscuits, and they are no trouble at all to make now. I'd always thought that biscuits baked in a wood range couldn't be beat, but

I declare the ones I make now are just as good. My electric range bakes cakes and pies fine, too. Steady electric heat helps everything turn out just right. It's wonderful to be able to set a regulator and get the exact temperature you want, without watching or turning the heat up or down. I use the oven for canning, too. Canning in an electric range is lots different from the hot way I used to do it!

"And cooking with eleectricity is so simple. I thought I might have to learn to cook all over again, but I didn't. I used my same recipes and do things just like I always did. The only difference is that cooking is easier now than it ever was."

"I take it you really like electric cookery," I ventured.

Her eyes shone brighter. "I should say I do. And there's another reason I haven't mentioned. Pa and I take great pride in keeping up-to-date. We think there's never been a better age than the one we live in now, so we want to do our cooking, like everything else, in the most modern way. You know, we older folks can really appreciate modern conveniences. We've lived in a time when there weren't any automobiles, airplanes, radios or telephones, and we really know the advantages of having them."

In the door then came Mr. Pickens—tall, hearty, jovial.

"So you're the reporter lady," he teased. "Ma's been well nigh out of her head thinking of things to tell you."

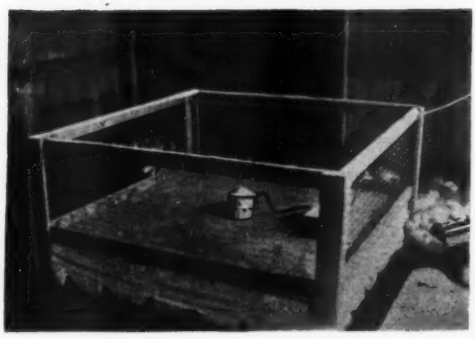
"Why, Pa, I have not," denied Mrs. Pickens laughingly.

"Ma sure does like her electric range," affirmed her husband. "She thinks it's about the best there is, and I guess she's tried about all kinds of stoves in the sixty-one years we've been married. I'm 81 and Ma's 77—both our birthdays are in February—and we've seen a lot of changes come in our day. Electricity is one of the biggest. To think that by stringing a wire into your farm you can have electric light or heat or power—it's wonderful. Why, electricity gives a farm all the conveniences a city has—but the farm still has it over the city for peace and quiet.

"Say, I forgot to tell you," he called as my car started to move, "I got a new electric razor the other day and I sure like it a lot better than my old cuttin' iron!"

"That's fine," I called. "Goodbye! Goodbye!" And I drove away with the picture in mind of two fine people in whose declining years electricity is lightening labor and bringing a lot of pleasure

Electric Brooder Experiences in Cold Windy Weather



THE accompanying illustration shows an electric brooder I have been using since 1937. The hover is constructed of two sheets of ½-inch Celotex painted red on top and white on the side to prevent chicks from picking it. The brooder is 47 in. x 48 in. with a commercial fan type heating unit and thermostat set in the center, and with adjustable legs. The wire-covered framework shown above the hover keeps the chicks from roosting on top until they are old enough not to need heat.

Before we used this hover we had a coal brooder for five years and were skeptical about the merits and the cost of operating an electric brooder. The first year we used it we bought new stovepipe and coal for our coal brooder so we would be ready in case we were dissatisfied with results. Now we have sold the pipe and burned the coal. March is a windy month and the coal brooder would really eat up fuel and produce a terrible odor anyway. My wife is very well pleased, as all she has to do now is to water and feed and regulate the building ventilation.

Our brooder house is 12x14 feet with windows that tilt in to direct the air upward away from the chicks. We had an electric meter on our brooder, and some of our records may be of interest to other farmers.

On March 17 we put 300 chicks under the brooder. Each morning at 7 o'colck we read the meter and outside temperature. The brooding period lasted 43 days, from March 17 to April 29. During that period the temperature was 32° or below on ten mornings, with one morning at 17° in a snow storm. The total electricity used was 184 kw-hrs, which at 3c cost $5.52 or 1.84c per chick. Mortality was 14 chicks. The brooding temperature was dropped 5° per week until we got down to 70°. That brooder does everything an old hen does except cluck.

EDDIE OPDENHOFF, *Kingfisher, Okla.*

Lights Protect 30,000 Turkeys

One of the largest, if not the largest flock of turkeys in Colorado is Joe Kline's 30,000 birds on Willow Springs Farm. The ranch is illuminated at night with electric lights to protect the birds from thieves.

FARM SHOP A GOOD INVESTMENT

By G. H. BLIESNER

MR. GUS KRAUSE, who operates a 310-acre farm near Hillsboro, Oregon, has just completed building one of the most modern farm shops in the West. It has a floor area 24x40 feet, with a 10-foot open front, and is equipped with a chain-hoist mounted on a track.

On most farms, such a shop layout might seem a little elaborate. On the Krause farm, however, the only farm animal is a dairy cow. Grain is grown on 208 acres of tillable land while the remaining 42 acres produce walnuts. The machinery used includes three tractors, a combine, power plows, mower, hay rake, discs, harrows, and other deep and surface tillage tools and harvesting machinery. An electrified walnut dryer and fanning mill is also in operation. Because of his experience in caring for equipment and in watching equipment costs, Mr. Krause's opinion regarding a shop should be helpful. This is what he has to say:

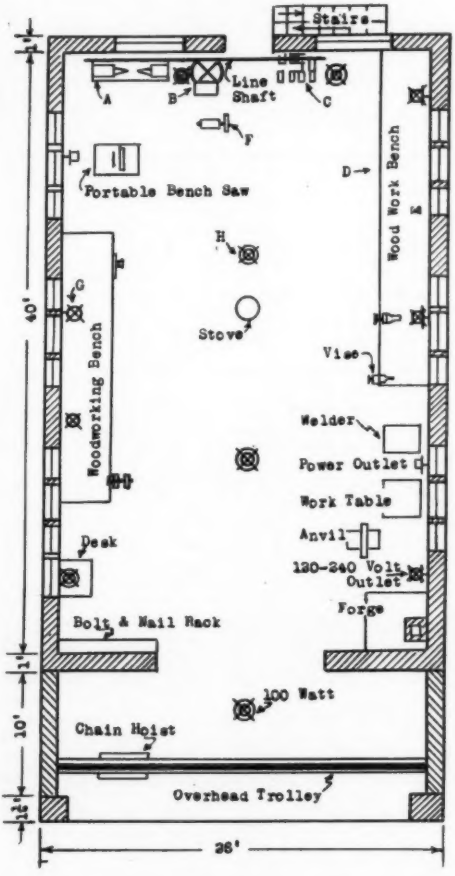
"A saving of $100 per year on the average mechanized 160-acre farm is a conservative estimate where an adequate farm shop and machine shed are available. With my farm shop I am able to continually keep my machinery and tools repaired. My shop is the focal point for all farm operations as tools are always needed in farm work. The shop building and equipment in it cost me approximately $2,500. This is more than the average farm will need, but I feel this investment is justified on my farm, as I have a $10,000 investment in farm machinery."

The shop tools include the following:

Equipment	Size	R.P.M.	Remarks
Line shaft	1-7/16"	600	1½ h.p. motor
Drill press	....	....	Line Shaft Slow Speed
Drill (portable)	½"	375	1/8 h.p.
Forge	18"	1725	1/10 h.p.
Power grinder	12"	2000	Line Shaft
Lathe (steel)	....	....	Line Shaft
Lighting	100-200 watts	....	1000 watts With reflectors
Radio	5-tube, 7 w.	....	
Saw (bench)	10"	3000	1 h.p.
Soldering iron	200 wats	....	
Welder	Arc—7.5-kva.	....	220-volt, 35 amps. primary.

Wall outlets are provided for both lighting and portable power equipment. The 120 and 240 volt outlets are separate so that only the specified equipment may be operated from each outlet. A 60-ampere, 240-volt entrance switch has proved to be large enough for the welder, as well as the other power demands. The farm is adequately served by a 5-kva. transformer.

An adjustable height for the forge and hood and good chimney construction are quite important to prevent soot from accumulating on shop tools. The stove pipe should be over ten inches in diameter to prevent a smoky room.



Plan of Work Shop on the Krause Farm

Identification of equipment is given in the following: (A) Steel lathe with drawer underneath for tools; (B) Drill press; (C) Grindstone; (D) 8 drawers, 6 inches deep and 24 inches wide under bench for devices, bolts, etc.; (E) Work bench covered with No. 26 galvanized iron; (F) A 1½-h.p. motor operates the line shaft; (G) 100-watt light with a reflector, also a power outlet; (H) 200-watt light with reflector.

Man is the only animal which devours his own kind, for I can apply no milder term to the governments of Europe and the general prey of the rich on the poor.

Thomas Jefferson.

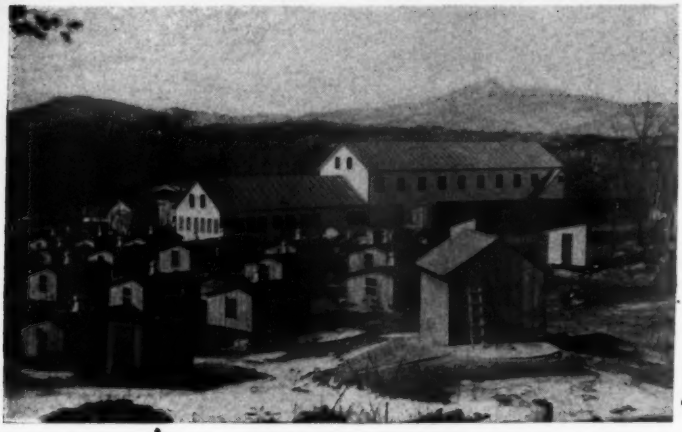
* * *

A little child, a limber elf,
Singing, dancing to itself, . . .
Makes such a vision to the sight
As fills a father's eyes with light.

S. T. Coleridge.

* * *

Crops supplied with ample moisture and fertility suffer less from insect pests and plant disease.



PINE TOP POULTRY FARM

Uses 5,000 to 15,000 Kw. Hrs. Per Month

NOT all of the large poultry farms are located on the Pacific Coast. Pine Top farm—one of the BIG ones—is located in Northern New Hampshire. Furthermore, the owner, Mr. Goodson, operates his plant with the conviction that the liberal use of electricity is good business and makes possible higher production at less labor cost.

Of significance to anyone who may have a doubt about the feasibility of electric brooding in cold climates is the fact that "Pine Top" has ten electric battery brooders with a capacity of 10,000 chicks, and twenty-eight cold-room, electric hover-type brooders which are operated *continuously*.

In addition to brooders, the farm is equipped with electric incubators to provide a constant chick supply. The automatic electric water system supplies running water to all of the buildings. More than sixty individual water warmers keep the water at the correct temperature in the laying houses. Eggs are graded with an electric grader.

The killing room is also provided with modern equipment which includes an electric semi-scalder and waxer and refrigeration for putting the birds on the market in good condition.

The total power consumed on the farm varies between 5,000 and 15,000 kilowatt-hours per month.

Mr. Goodson's experience has prompted these conclusions:

"One egg a day will cover the cost of using an electric water warmer."

"Running water supplied by an electric pump is less expensive than carrying water."

"The electric egg grader works for a month for what it would cost to hire one man for one hour."

"Electricity is the most willing and hardest working hired man on my farm and receives the lowest pay."

JOSEPH H. BODWELL

Upper: Pine Top Farm, Tamworth, N. H., showing part of the poultry plant.

Right: The egg grading room with good lights, refrigeration and the grading machine that works for less than 50¢ per month.

ELECTRIC MOTORS

Article 2. Overloading and Protecting Motors—Types of Motors: Split Phase and Capacitor

By H. P. RICHTER

Temperature Rise in Motors—All electrical devices heat up in use; motors are no exception. However, really well designed motors are so built that if run continuously without interruption, delivering their full rated horsepower (the horsepower stamped on the nameplate), the temperature of the motor will not increase by more than 40° Centigrade or 72° Fahrenheit, over and above room temperature. On a hot summer's day the temperature of the air in an enclosed pump-house, for example, may be as high as 110°; add to this the 72° rise and you have a total of 182°, not far below the boiling point of water. This will feel decidedly hot to the hand but need not cause any concern, for it is entirely safe so far as the motor is concerned. Install motors so that fresh air can get at them for ventilation.

Motor Protection—It takes a good deal more power to start almost any machine than it does to keep the same machine running; this is proved by the fact that if you want to push a wagon by hand, it is hard to start but easier to keep it going. So also with electric motors—it takes considerably more amperes to start a motor than to keep it running at full speed at rated horsepower. An ordinary washing-machine motor may require from 5 to 6 amperes while delivering full rated horsepower, but may require as much as 30 amperes for a few seconds while coming up to speed.

Likewise, when a motor is overloaded so that it is forced to deliver more than its rated horsepower, it consumes more than its normal amperage from the line.

Although any motor will not be harmed by current considerably beyond normal flowing through it for a short time, still it will burn out if excessive current flows for a considerable period of time, just as a man can walk at say 4 miles per hour for a long distance, but can't run at 10 miles an hour for more than a short distance. Therefore it is necessary to protect the motor with a device which will permit considerably more than normal current to flow for a *short* time, but will disconnect the motor if it flows for a *considerable* time. Unless this is done, the motor may burn out, requiring an expensive rewinding job.

The simplest protective device is an ordinary fuse, but this really does not protect the motor very much, because if it is big enough to carry the starting amperage, it so large that it will carry the overload amperage continuously, thus not protecting against overloads.

There is now available another fuse which looks like an ordinary fuse, but is made differently inside. This is the "time-lag" type of fuse which carries a temporary overload long enough to permit the motor to start, but blows just like an ordinary fuse on continuous small overloads or on short circuits. This type of fuse is available in a number of brands, such as Thermatrip, Fusetron, and similar names. Such fuses do provide good protection for motors, provided the amperage selected is not over 140% of the amperage stamped on the nameplate of the motor. If an amperage greater than this is selected, it will provide little protection against overloads.

When using fuses to protect motors, use one in each wire if the motor operates on 230 volts, but only one (in the block or ungrounded wire) if it operates on 115 volts.

The best protection for a motor is afforded by thermal overload devices which carry normal current permanently without tripping, carry a small overload for a long time, and trip quickly if a very large overload is imposed. Such devices are in the case of small motors often built into the motor, and are known by various names such as "Thermotron," "Thermoguard," and so on. When they trip, merely reset after the motor cools off. Thermal overload devices are also available in the form of separate devices which usually include start and stop switches also.

Types of Motors—There are a great many different types of motors in use. Only the more common ones can be here described. The current found in practically all homes and farms is alternating current, 115 to 230 volts, usually 60 cycles; in a few localities 25 or 50 cycles. With rare exceptions, it is what is known as single-phase alternating current; the incoming wires may be either two or three in number. Three-phase alternating current is common in factories but seldom found in homes or farms. It may be supplied by either three or four wires.

Split-Phase Motors—This type of motor operates only on single-phase alternating current. It is the most simple type of motor made, which makes it relatively trouble-free; there are no brushes, no commutator. It is available only in sizes of 1/3 hp. and smaller. When up to full speed, this type of motor develops just as much power as any other type of motor, but it is not able to start heavy loads. Therefore it should never be used on any machine which is hard to start, such as a deep-well water pump, or an air compressor that has to start against compression. It may be used on any machine which is easy to start, or on one where the load is thrown on after the machine is up to full speed. It is entirely suitable for washing machines, grinders, saws and lathes, and general utility use. It may be used on paint sprayers which do not start against compression, but not on those that start against pressure.

Capacitor Motors—This type of motor also operates only on single-phase alternating current. It is a rather new type of motor, having come into general use during the last 10 years. In construction it is almost identical with the split-

(*More on page* 25)

How to Do

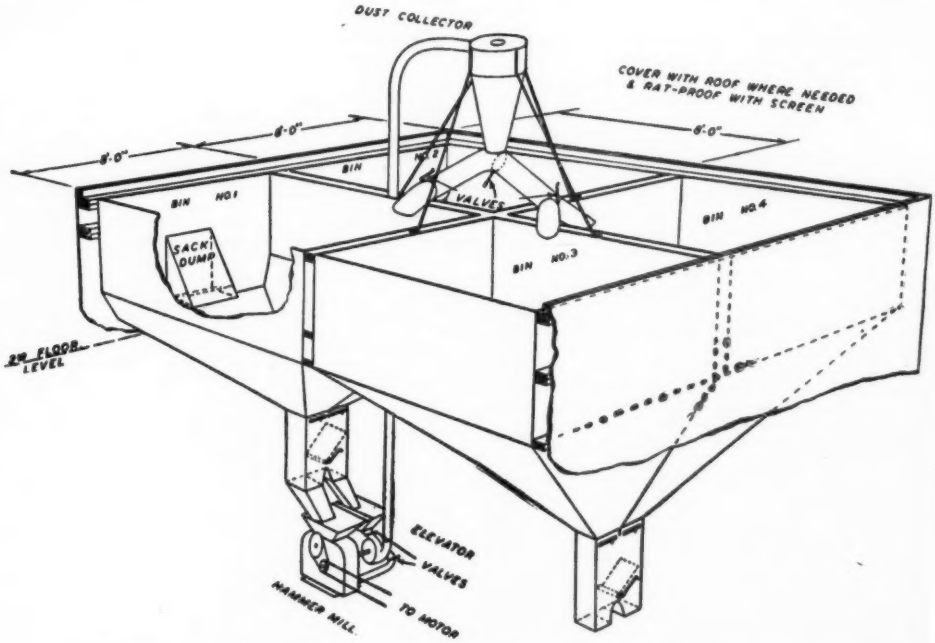
A 20 H.P. Feed Grinding Job With a 1 to 3 H.P. Motor

THE accompanying drawing was sent by Mr. C. P. Wagner of Minneapolis as a desirable layout of bins and grinder where one of the smaller feed grinders with blower-elevator is to be used for grinding, elevating and mixing medium or large quantities of grain and concentrates. The plan is one proposed and tried out by Prof. Beresford of the University of Idaho. The advantage of having bins conveniently arranged is, of course, the saving of labor in handling, grinding and mixing grain—and of equal importance the cutting down on the size and cost of the grinding equipment necessary to do the job.

With the arrangement shown, valves in chutes, pipes and mill may be set and the grinding or mixing will be done with very little attention while the operator is doing other chores about the barn. The bins are located on the second floor of the building, with the mill on the first floor. Sack dumps are provided in bins 1 and 2 just above second floor level for emptying grain which is to be elevated into another bin, or for dumping salt, tankage or mill feeds to be mixed with ground grain. They are also handy where grinding is to be done for neighbors. Bins may be made rat-proof by applying ¼-inch mesh screen to the framing outside the bins before nailing on the boards.

In mixing feed, the grain should be ground and elevated into bin 1 or 2. The other ingredients, such as salt, bran and oilmeal are dumped into the same bin, as the feed is being ground. All the ingredients in bin 1 are then allowed to flow down through the blower of the mill and be elevated into bin 2 for the first mix. Next empty bin 2, elevating back into bin 1 for the second mix. If three mixes are necessary to get uniformity, the next elevation should be into bin 3 or 4, where the mixed feed is to be stored for use or sacked from the sacking spouts below.

The equipment is always ready to grind, mix or elevate. No hard starting; little lifting; freshly ground and mixed feeds; a rainy day job or a regular routine while doing other chores; and a money saver.



Four-bin arrangement with hammer mill and blower elevator for grinding, mixing and sacking or storing.

NEW LAMPS FOR OLD

ABOVE is a picture of part of a group attending an all-day lamp clinic at Crockett, Wythe County, Virginia, sponsored by Miss Chilton Ryburn, County Home Demonstration Agent. This group brought their lunch and made a day of learning about good lighting and modernizing their old oil and other types of lamps into sight saving ones.

Here is a comparatively new service being rendered by the County Demonstration Agent and one long neglected. The new sight saving lamps not only give better light that protects the eyes of old and the young; they also add beauty and attractiveness to the home.

If you are one of those thousands of farm women who has recently received electricity, you too will be interested to learn as did the above group that you can modernize your old oil and other types of lamps into attractive sight saving types for a nominal cost, ranging anywhere from 50c up. If you do not have a County Demonstrator you could easily enough work up a small class in your own community and secure the services of your electric service company Home Lighting Advisor who will furnish illustrations and instructions for making over your old lamps and advise you where to secure the necessary parts.

SARAH E. MOORE, Home Lighting Advisor, Appalachian Electric Power Company, Bluefield, West Virginia.

Motor Oiling Chart

THE care of motors is very simple. Most of them will run for many years with no more attention than an occasional oiling. That oiling, however, is essential, and usually the oiling of the driven machine is even more important. Washing machine motors, pump motors and refrigerator motors have been known to blow fuses and sometimes destroy themselves by overheating just because the owner was negligent about oiling the machine. Oiling is such a simple operation, yet so easily forgotten and so costly when neglected.

Below is a chart suggested by W. E. Douglas, Division Manager of the Monongahela West Penn Power Co. at Wellsburg, W. Va. It may be expanded or changed to fit your motor driven equipment. It may save you dollars if you put it up in a convenient place and look at it regularly every month. Some motors and some refrigerators do not need oiling. No motor should be doused so profusely that oil gets on the commutator or brushes. Follow the manufacturer's instructions for each machine, noting them on your chart.

Oiling Chart

Machine	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
5 h.p. portable motor	—	x	—	—	—	x	—	—	x	—	—	—
Feed grinder	x	x	x	x	—	—	x	—	x	x	x	x
Oil burner	x	x	x	—	x	—	—	—	x	x	—	x
Washing machine	x	x	x	x	x	x	x	x	x	x	x	x
Sewing machine	—	x	—	—	x	—	—	x	—	—	x	—
Refrigerator	—	—	x	—	—	x	—	x	—	x	—	—
Mixer	—	x	—	—	x	—	—	x	—	—	x	—
Water pump	x	x	x	x	x	x	x	x	x	x	x	x
Fans	—	—	—	—	—	x	—	x	—	—	—	—

Electrical HOUSEKEEPING

Conducted by GAIL MEREDITH

A Happy New Year to You

AT Thanksgiving time last year I heard a tiny wisp of a woman, 86 years old her last birthday, say with firmness and joy, "This last year has been the happiest year of my life." Wars and rumors of wars, unemployment and unrest had not been able to undermine her inner tranquility. The happiest year of her life! May this year that is coming be that for you! The best and happiest year of your life—so far!

Ironing a Shirt

LAST week I sat and watched a skillful ironer do shirts, a dozen of them, or perhaps it was fourteen. It looked like a lot of shirts, anyway. I noticed that she began just the same way each time and that every shirt finished up with just the same slick curve on the collar. So I asked her if she always ironed the shirts the same way.

"Oh, yes," she said. "I've learned a good way to go at them, and I can do them lots quicker if I follow the same routine for each shirt."

Perhaps you have worked out a method of your own that gives you good results. If you haven't, and if you are still practicing with shirts on your new ironer, perhaps you would like to read the directions she gave me.

1. Begin with the sleeves. Fold the sleeve on the underarm seam and put it on the roll with the cuff opening up and the cuff hanging below the lower edge of the shoe. Iron the sleeve to the shoulder. Turn the sleeve over and iron the other side.

2. Cuffs next. Put the cuff on the end of the roll. Iron the wrong side first, and finish on the right. By holding the lower part of the sleeve at an angle across the open end of the roll, you can run it through and pull out the gathers as the sleeve rolls through.

3. Fold the yoke and lay it over the roll slantwise, so you can iron it up to the collar band. Then release the shoe and shift the shirt around so the neck band comes just to the edge of the roll. Iron the middle of the yoke and finish the other side on the other end of the roll.

4. The back is easy. Put the underarm seam on the top of the roll and iron across to the other seam. Release the shoe so you can pull the shirt along the roll till the ironed yoke is close to the edge of the roll. Then iron across from sleeve to sleeve.

5. Buttonhole side of the front next. Iron the buttonhole edge first, going back and forth till it is dry and smooth. Then iron across to the seam. Stop the roll and shift the shirt so the sleeve hangs over the edge of the roll and iron up to the collar.

6. The button side. Lay the shirt lengthwise on the roll, button side down, and iron the edge dry.

The pile of shirts grows fast.

Then iron across to the seam and the sleeve, turning the shirt as you did for the other side to iron up to the collar.

7. Which brings us to the last, most important, but really simple step, ironing the collar. Lay the collar flat on the roll, wrong side up. Iron it dry. Release the shoe. Fold the collar back and iron it on the right side over the end of the roll.

• • •

Butter Money

IF you had visited the hayloft of the electrified farm at the World's Fair in New York on the twenty-first of September last year, you might have heard Mr. Lyle, of the U. S. D. A., tell a group of salesmen about two families he knew who were making electricity work for money.

"A Mississippi mother and daughter," he said, "wanted some new furnishings for the living room.

ELECTRICITY HELPED MAKE HOUSEHOLD JOB LIGHTER

(Winning Letter for October Contest)

I want to tell others how Electricity helped make a household job lighter.

Our kitchen has two small windows between the kitchen and back porch. We keep our Electric Washing Machine on the porch, which has a concrete floor. Under these small windows inside the kitchen is the sink, with hot and cold water faucets. When we are ready to wash, we open the window and screw hose to our hot water faucet, carrying our water to the washing machine. Same way for cold water.

When we are through, we screw our hose to washing machine and run the water outdoors.

Our water is pumped by Electricity, thereby making an easy job of a hard one, the old way.

With the aid of these Electric conveniences we have been able to wash quilts and blankets for our neighbors and relatives, making money for other much needed conveniences.

MRS. M. J. RINEHART,
Rienzi, Miss., R. 2.

They installed a 6 by 6 ft. electric hot bed and grew tomato plants for the local market. They realized $36 in sales. They estimated the cost of electric energy at $1.80.

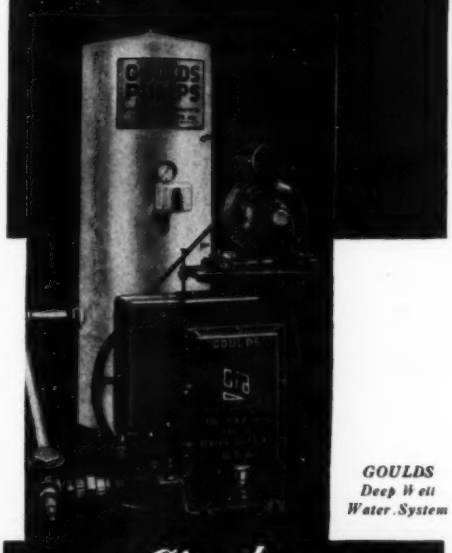
"They used scrap lumber and the service man lent them the cable and thermostat. They could have bought it for about $12 and it would have lasted for several years. I think $2.40 would have been a fair depreciation charge."

Another family he knew sold butter.

"They put a bowl on a shelf near the refrigerator," he went on. "In this bowl they placed the money received from the sale of butter.

"They couldn't sell their butter before because it was a liquid. After they got an electric re-

GIVE MOTHER A BREAK THIS YEAR



GOULDS Deep Well Water System

Give her RUNNING WATER

Install a Goulds CID Water System . . . give mother plenty of fresh running water at the turn of a faucet anywhere in the house.

What's more . . . in and around the barn buildings where farm income is earned that same supply of running water will increase crop, livestock and poultry yields and give you a higher quality product to sell.

Shallow Well

Fire menace will no longer be a worry. A Goulds CID Water System will actually pay you a profit instead of being an expense. It is easy and quick to install and use . . . smooth, quiet running pumps, long life and economy are features that make it possible for a Goulds CID Water System to give you a better and richer life on the farm.

Your local dealer can show you Goulds deep and shallow well models. Phone or write him today.

GOULDS PUMPS, Inc., 340 Fall St., Seneca Falls, N.Y.

GOULDS

110

frigerator, the butter was solid and they could sell it,—and did.

"They put the money in this bowl as they got it. They took it out only to pay the electric bill and the installments on the refrigerator. On October first the money in the bowl had paid all these bills and there were five dollars left."

I do not know how long it took them to pay for that refrigerator. Mr. Lyle didn't say, but it must have given the women folks in that house quite a thrill to do it with butter money when they could not sell butter before.

• • •

With a Roaster

WE'VE been moving, and for five solid weeks I have kept house without a stove. I suppose "kept house" is really an exaggeration, for they are still building our house around us. But we are living in it, and I have managed to keep us fed with the help of wires running to a roaster, casserole, waffle iron, coffee maker and tea kettle.

I fried pheasant in this big pan while sweet potatoes and green beans cooked in the curved pans at the ends.

Please don't think I'm not going to welcome that truck when it rolls up with the range on it. I will. There are things you just can't do easily even in the most versatile roaster. Their makers never claimed that you should be using them for white sauce and boiled frostings. It can be done, I find, if I'm careful and patient, but I'd rather make them on top of the stove.

But there are plenty of meals that I can cook easily enough. We've had pheasant cooked in the casserole and fried crisp and brown in one dish of the roaster while sweet potatoes and green beans were cooking in the others. We've had pork roast and baked potatoes, and soups and stews that would make your mouth water. We've had cake and pie, and every week, right along, I've kept on baking bread. I always do.

My husband wouldn't notice if we didn't have cake from one month's end to another. And it's only when pumpkins put in an appearance that he gets very enthusiastic about pie. But bread is different. He wants a lot of bread and he likes to have me make it myself. Besides, I like to.

Sometimes we buy a few pounds of clean wheat and grind it up in the coffee grinder of my mixer. Then we have cracked wheat bread that we like best of all. Sometimes I add whole wheat flour, sometimes graham, and sometimes the commercial bran they sell for breakfast food. One cup of that instead of the graham or whole wheat makes an excellent bread.

This is the way I make our bread in case you are interested. I begin by putting a cake of compressed yeast in half a cup of warm water with two tablespoons of sugar. If I'm in a hurry, I use two cakes of yeast or even three.

After the yeast is dissolved, I put two cups of warm water in the bowl of my mixer with two tablespoons of fat and three teaspoons of salt. Then I add a cup of flour and beat until the mixture is smooth. After that I add flour gradually, both the white and a cup of whole wheat, until the sponge is quite thick. Then I stop the mixer, take off the flat beater and add a crook necked tool they call the bread hook. That kneads in the rest of the flour, enough to make a firm dough.

Sometimes I use potato water, and sometimes I use milk. Quite often I turn the bread out on the board and knead it by hand for a minute or two. The rest of the time I just leave it as it is and let it rise right in the mixer bowl.

When the bread is ready to bake, I put it on the rack in my roaster, heated to 425 degrees. I let it bake at that temperature for about fifteen minutes. Then I turn the thermostat back to 350 and bake it for an hour longer.

The loaves come out golden brown with a soft, tender crust.

January Contest

We would like to have you start off this new year by making up a week's menus—cold weather menus, that you do serve your families, or that you would like to serve them, if ———. That *if* might mean time; it might mean availability of food; it might mean availability of storage or adequate equipment for preparation.

If there is an *if*, explain what it is, please, in a note attached to your menus. Begin with Monday and carry the plan through the week. Very likely you will have some further explanation about the menus that you would like to add. Just add a note. I think it would be particularly interesting if you told us how planning ahead gave you an opportunity for saving—saving of food, time or effort.

The letters with the menus will be due January 20, 1940.

We will pay five dollars for the winning menus, and a dollar for any others we might use later.

Address your letter to Gail Meredith, 700 S. Mills Street, Madison, Wisconsin.

I'll be glad to have my kitchen finished, of course, but it has been fun to see how much I could do with my roaster.

• • •

Joan mixes the cakes.

Sponge Drop Cakes

IT isn't often we get a picture of a really truly actress making honest to goodness cakes. But here we have it. This is Joan Brodel, a little red head who was Robert Taylor's young sister in *Camille*. She gives us this recipe for sponge drop cakes that are easy to make and sound simple and appetizing.

3 eggs
½ cup sugar
1 tbsp cold water
½ tsp lemon flavoring
½ tsp grated lemon rind
½ cup flour
¼ tsp cream of tartar
⅛ tsp salt

Beat egg yolks until thick and lemon colored. (2 minutes with electric beater.)

Beat in sugar gradually.

Beat in water, flavoring and lemon rind.

Sift flour once before measuring, and beat it into the egg yolk mixture.

Beat egg whites until frothy, add cream of tartar and salt, and beat until whites are stiff enough to hold a point. Fold into yolk mixture.

Drop by spoonfuls onto ungreased wrapping paper placed on baking sheet. Have drops about 1½ to 2 inches across before baking.

Bake as soon as the batter is dropped onto the paper. When done, remove immediately from the paper by running a spatula under each cake.

Temperature, 375 degrees. Time, 12 to 15 minutes. 6 dozen, 2 inches.

Women Study Frozen Food

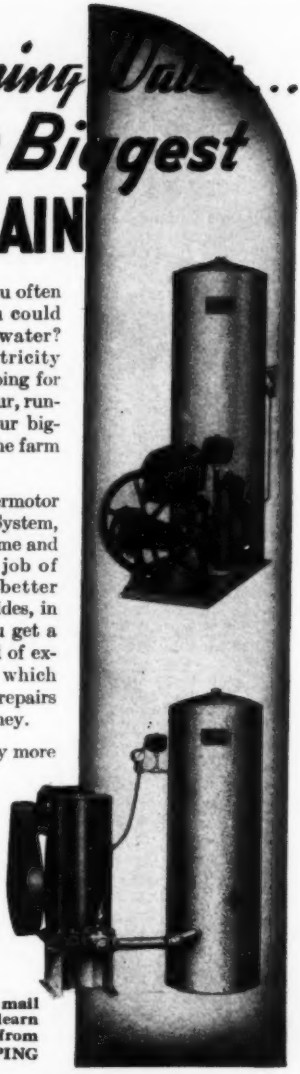
Members of the Community Home Demonstration Club have been studying frozen foods in cooperation with Clara Anderson, home demonstration agent at Pueblo, Colo. Last summer they froze various fruits and vegetables, kept them frozen, and found them to be delicious this fall.

Running Water...
YOUR Biggest
BARGAIN

HAVEN'T you often wished you could enjoy running water? Well, with electricity doing your pumping for a few cents an hour, running water is your biggest bargain on the farm today.

With a modern Aermotor Electric Water System, you can do the time and labor-consuming job of pumping water better and cheaper. Besides, in an Aermotor, you get a pumping unit full of exclusive features which eliminate costly repairs and save you money.

You don't pay any more for this superiority, for Aermotor deep and shallow well systems are priced lower than most quality-built outfits. See them at your Aermotor dealer.



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In the meantime, mail the coupon . . . and learn how you profit . . . from AERMOTOR PUMPING

AERMOTOR
Electric **WATER SYSTEMS**

MAIL COUPON NOW

Aermotor Co. (*Dept. E-1*)
2500 Roosevelt Road, Chicago, Ill.
Send free "Facts" Book about Aermotor Water Systems, and name of nearest dealer.

*Name*_____

*Address*_____

ON THE AIR

Conducted by
JEROME J. HENRY

Changed Square Dance Calling

SQUARE dance calling on the radio is a far more ingenious art than square dance calling at the old fashioned Saturday night barn dances. Arky, the Arkansas Woodchopper, in the famous NBC Barn Dance program, says that in the old days there were five standard square dances: the Ocean Wave, the Grapewine Twist, the Sally Goodwin, the Bird in the Cage, and the Cheat or Swing.

Gale Page, beautiful star of the radio and the screen.

The conventional opening for every square dance went like this: "Lady right, gent on left, join eight hands and circle to your left. Break and swing, form a line, reverse back, lady in the lead and gent behind. All eight dance as purty as you can, gents to the left with your left hand."

With the advent of square dances on the radio, things changed. The radio audience listens to the caller's rhymes more critically and expects to hear some variety from week to week. So Arky works at home and makes them up with his rhyming dictionary.

He has worked out more than 150 different variations of the square dance routine including such calls as "Call the cow to catch the calf, meet your partners once and a half," and "Back to Your Partner, right and left through, shuffle along, like an old choo-choo."

• • •

Radio Serial Looking Up

The radio serial is looking up—definitely.

Lester Vail, network director, who has worked with the radio dramatic serial since it was a baby, and has himself given it many of the vitamins that have strengthened its frame and fibre, thinks it is doing well for its age.

Of course there are certain crudities that have to be ironed out. There are problems in the mechanics of radio serializations such as the business of giving the names of the characters and explaining the relationship of one to the other before every episode. This method of summing up, or bringing the listeners up to date, is time-consuming, and in terms of dramatic expression, is artificial and not very interesting.

Vail predicts that in the future the synopsis in the continued story will be told in dramatic fashion, just as the continuation of the episode itself. Endings as well as introductions will likewise break away from the conventional, he believes. The business of creating purposeful suspense, of working up to deliberate climaxes on certain days of the week, may be desirable from the point of view of showmanship, but it is likely as not to lead into false situations, according to Vail.

The vital ingredient of the radio serial is action, —plenty of action. It must be fast, dynamic, and move along at a clip which is often too impatient to tarry with characterization. As a rule the serial is streamlined for speed. It is straight melodrama and as such must contain the clashes of wills. Vail has a unique way of directing his performers. He prefers to paint a picture for the actor rather than tell him how to read his lines. To an excited actor, for example, he said, "You are tensely excited. Give me a little broken field running." To another, "You are suffering not from pain but from loss of blood."

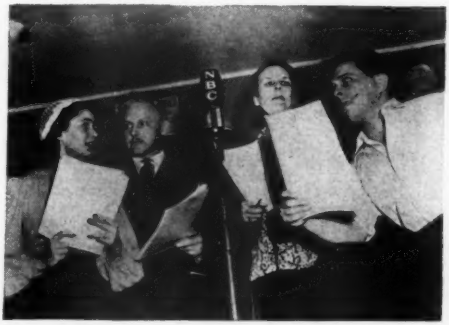
• • •

Cracks His Voice

Ezra Stone who plays the role of the unpredictable high school boy in the Aldrich Family series, invariably gets a laugh by cracking his voice. But it's no fun to Ezra.

In order to produce the crack, Ezra has to swallow air, which is not bad in itself except that it has two unusual reactions. It makes him yawn and it makes him burp. The thought that the latter reaction might be picked up by the sensitive microphone concerns him most on his broadcasts over the networks.

Of course, Ezra can crack his voice without swallowing air, but it is more of a strain. As it is he loses his voice twice a year and has to medicate himself sucking lemons.

Stone, although more than 20 years old, has been taking "brat" roles in the theatre for the past ten years. His first experience as an actor was in the role of an impish, trouble-making youngster. And he has continued in strikingly similar roles ever since, both on the stage and the radio.

The Aldrich Family—Ann Lincoln, House Jamison, Katherine Raht, and Ezra Stone.

Our Beloved Countryside

For we who love the things God made;
The bursting bud and emerald blade;
The quiet sky, the rugged hill,
Each towering pine and daffodil
Thank God each day we can abide
In His bejeweled countryside.

Here peace and loveliness abound
In harmonies of sight and sound
While pulsing life in earth and man
Are mingled in His perfect plan.
No blessings here have been denied
To those who love their countryside.

We find life's truest flavor here
Where trees bend low and stars seem near;
Where labor's sweet reward is blest
With sustenance and peaceful rest . . .
Away from cities rushing tide
In our beloved countryside.

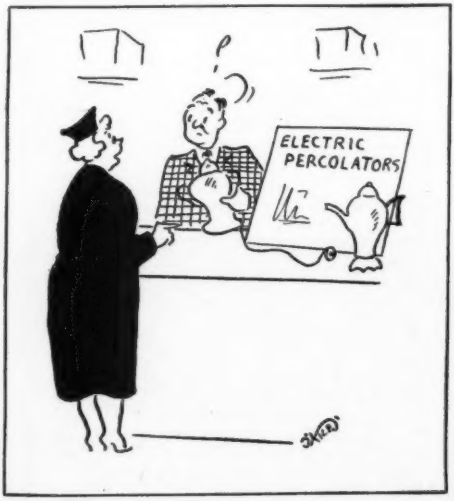
ESTHER CUSHMAN RANDALL,
Coldwater, Mich.

Thermostats for Fountain Heaters

Poultrymen owning manually controlled electric water fountain heaters are reminded that costs can be lowered, the worry of attention eliminated, and automatic correlation with outside temperatures obtained through the use of a master thermostat and a relay.

The thermostat is usually located outdoors and set for five degrees or so below freezing to take advantage of the heat lag in the poultry house. The relay is necessary because the thermostat does not usually have current-carrying capacity sufficient to handle the added load of the several heaters. In practice, the thermostat actuates the relay control which in turn closes the switch and turns on or off the service line to the drinking fountains.

W. C. KRUEGER, N. J. Extension Service.



"I wonder if Homer's experimenting with 'ready dunked' doughnuts had anything to do with it not working right?"

MODERN FARM LIGHTING

BENJAMIN
YARD LIGHT

Light your farm yards and you'll get the rush work done on time!

Here's an inexpensive Yard light for your farm that will make you wonder how you ever got along without it! Manufactured by Benjamin, world leader in lighting equipment, this reflector is made of lifetime porcelain enameled steel. Easy to keep clean. Comes packaged ready for installation. Nothing else to buy. Package contains reflector, socket, conduit arm, wall fitting, bolts and 2 ft. wire leads.

SEE YOUR ELECTRICAL STORE OR WRITE THE BENJAMIN ELECTRIC MFG. CO. DES PLAINES, ILL.

BENJAMIN
VARIETY-LITE
NEW LOW COST PORTABLE FLOODLIGHT FOR FARM FUN

on the farm! Think of how your family and friends will enjoy a yard floodlighted for night sports, night parties, etc. Provides protection against prowlers, too! Use it for night work. Take it from one location to another. A quality product made of lifetime porcelain enameled steel. Complete with unbreakable plug and extension cord . . . efficient—low priced.

BENJAMIN LIGHTING EQUIPMENT
Distributed Exclusively Through Electrical Wholesalers

SAVE ½ the COST
of Separating Milk

Startling new cream separator developments cut cost of separating milk over 50%! It's the sensation of 1939! Don't buy a cream separator until you get the facts about Anker-Holth's latest achievement. Big value in first cost! Big saving every day you use it!

Write Immediately
For Full Particulars

Whether you milk 5 cows or 50, write and learn how you can make more profit from your milk than you have ever made before. Write at once to

DROP DOOR SHELF
21 EXCLUSIVE FEATURES

Anker-Holth
Dept. 11
Port Huron, Mich.

Brood ELECTRICALLY with a TRUMBULL

POULTRYMEN ASKED FOR IT—HERE IT IS!

Trumbulls are Complete Brooding Machines, built for use anywhere, anytime of year. They will raise more and better birds for less money. Get all the facts. Ask for our Bulletin 10008, "The Electric System of Brooding."

THE TRUMBULL ELECTRIC MFG. CO.
1012 Woodford Avenue
Plainville, Conn.

Radio Interference from Electric Fences

A large manufacturer of electric fences, commenting on a question in our Questions and Answers Department, says that radio interference from electric fences is of two types. (1) A kick-back on the power line caused by the circuit interrupter in the fence controller; and (2) Small sparks or leakage from the fence wire or connections making a sound similar to static noises. The first type of noise is pretty well eliminated in good fence controllers by means of a circuit filter or condenser. About 10 per cent of the cases of noise investigated were due to poor installation of the fence causing noises of the second type. The following should be checked as possible sources of trouble.

1. Does the attachment plug make firm contact in the power outlet?
2. Are fuses and signal lamps screwed tightly in their sockets
3. Is circuit interrupter working evenly without arcing or burning the points?
4. Are all ground connections tight and free from rust, and does ground rod extend to permanent moisture level? The filter bleeds interference to the soil through these connections and they must be tight.

Some radio set-ups are such that even when all of these conditions are right, there may be some noise. In this case you may have to experiment by changing the aerial location, direction or height from fence or power lines.

ELECTRICITY HELPED ME EARN THIS MONEY

Farm Shop Pays Dividends

For the past five years I have operated a small woodworking shop as a hobby along with running a 160-acre farm. Most of my shop work is done in the winter when farm work is slack. I did not have electricity before last fall, so used a big, clumsy gasoline engine for power for my lathe and saw. It shook the whole shop. After installing electricity I changed to electric motors, and find that I am able to do better work, quicker and more economical. I am enclosing a photo of a small tractor model which I made out of wood in my shop as an example of some of the work I am doing.

With my neighbors in the immediate and surrounding territories getting electricity I saw a chance to help them out in getting some of their machinery changed over to operate with electric motors, so I advertised in the local paper that I would make pulleys and drives for motor-driven machinery. I have made a great number of pulleys on my lathe, principally for fanning mills, and so have saved my neighbors money by not having to buy the regular motor drive for the different machinery, and have received cash dividends from my hobby.

In making a pulley for a fanning mill, I got the proper shaft speed from the manufacturer and computed the correct pulley size, so that my work would be satisfactory.

JOHN A. NEWMAN,
Contest Letter Wood Lake, Minn.

Grab a kilowatt-hour by the tail and see how far you can throw him. He'll hit most of the light, heat, cooling and power jobs on the farm—and still bounce.

ASK FOR IT...IT'S FREE

As a reader of ELECTRICITY ON THE FARM you are entitled to our buyers' information service free of cost. When looking for information about equipment or material that you plan to buy, first read carefully the advertisements in this issue. They are your best guide. Then, if you do not find what you want, just use the coupon below to tell us what you need and we will see that you get the information you want.

USE THIS READER SERVICE COUPON
The more clearly you specify what you want, the more exactly we can meet your requirements.

ELECTRICITY ON THE FARM
Readers' Service Dept., 24 W. 40th St., New York

Without cost to me, please have manufacturers send complete information on the following Electrically Operated Equipment which I am thinking of buying:

.....

.....

My name is .....

Address .....

I get electricity from .....

.....

Check here ☐ if dealer. 1-40

Page Portable Milker Saves
time — work — money

Costs you less. Milks 20-25 cows an hour. **Quickly, easily cleaned. Sanitary**—nickel silver only metal to touch milk. **Safe**—suction gauge. High-speed device, 3rd cow attachment. Visible milking—no costly pipe lines. Gas or electric.

WRITE today for FREE Colorful Catalog

PIONEER MFG. CO.
Dept. KK-10
West Allis, Wis.

QUESTIONS and ANSWERS

Direct Current Appliances

Question: *What farm equipment can be supplied in 32 volt D. C.?* E. L. W., Neb.

Answer: Practically all household equipment and motors in sizes up to 1 H. P. are made in 32 volt D. C. ratings.

Cooking in a Trailer

Question: Is it possible to cook and bake for a *family of three without extra wiring for a range, when a trailer is used as a permanent home?* Mrs. W. S., Mich.

Answer: An electric roaster and a two-unit electric hotplate would probably be very satisfactory for cooking in your permanent trailer home. Or you might use one of the small electric ranges consisting of an oven and broiler with two small hotplates, all as one unit, using a maximum of 1650 watts.

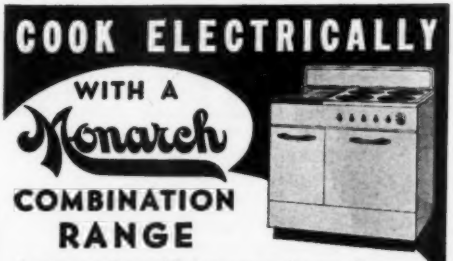
If the question you asked means could you use this equipment on a lighting circuit, the answer is that it would very likely be unsatisfactory. If you had a heavy duty circuit and No. 12 wire or larger and were not too far from a main service, it would be satisfactory.

What Is a Kilowatt-Hour? How Many Do Motors and Lamps Use?

Question: *What or how much is a kilowatt-hour? How much electricity is used in an hour by a ⅛, ¼, ½, and 1 h. p. motor? By a 40, 60, 100 and 250 watt lamp bulb?* H. R. H., Pa.

Answer: Imagine you have a garden hose with a sprinkler nozzle connected to a water pipe under constant pressure. Turn off the nozzle entirely. You still have pressure in the hose but no water flowing. Open the nozzle and water flows. Squirt the water into gallon cans. The number of gallons per minute is the rate of use. If you are buying the water, you put a water meter in the pipeline, and you pay for the number of gallons passing through the meter.

Imagine you have an electric circuit with a 1



A size and model for every home. See your Monarch retail outlet or write for particulars.
MALLEABLE IRON RANGE CO.
1239 LAKE STREET BEAVER DAM, WIS.

Speedy
PAINT
SPRAYERS
HERE'S A BIG NEW V-TWIN
100% OIL-LESS SPRAYER
Just out—send for illustrated folder showing this professional type sprayer—for paint, lacquer, enamel, varnish, kalsomine, insecticides. Special chuck inflates tires. Never needs oiling! It's easy and economical to paint barns, walls, pens, furniture, cars, equipment. Complete as shown, less motor, only $34.50. Other electric sprayers $5.10 and up. Write for free sprayer data now! Sold at dealers only.
DEALERS:
Send for catalog, price list, discounts on low cost, portable, W. R. Brown Paint Sprayers—electric and auto-power models.
W. R. BROWN CORPORATION
Dept. C—5729 Armitage Avenue, Chicago, Ill., U. S. A.

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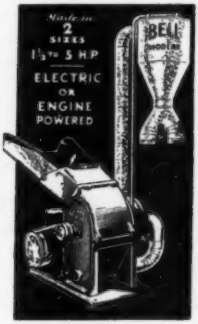
and for LESS COST!!
Use an ANDERSON
ELECTRIC BROODER
Brood chicks the safe, low-cost, modern way—with electricity. Insist on a genuine Anderson Electric Brooder and profit by new, sound and up-to-date improvements. Models . . $1.75 to $39.50
Retail from $1.75 up
See your Dealer or Write today for low prices.
ANDERSON (Fan Type) Nu-Air
For those who want the best. Has cut operating costs 25 per cent under test.
Dealers . . Write for new set-up.
Everything in Poultry Supplies
ANDERSON BOX COMPANY
Dept. 150 INDIANAPOLIS, INDIANA



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With a "BELL" MILL
SELLS FOR A LOW PRICE, on 60 Days' Approval, with Liberal Terms. Grinds wheat and Shelled Corn for as little as 6 cents a Ton. Elevates both ground and unground feed and grain. Capacities up to a Ton an Hour.
SEND FOR 24-PAGE ILLUSTRATED BOOK on "Stock Feed Grinding for Profit on the Farm," based on latest official tests. No cost or obligation, write today. DEALERS WANTED.
THE C. S. BELL CO.
Mfrs. Electric Hammer Mills, Corn Shellers & Feed Mixers.
Dept. 74, HILLSBORO, OHIO

Expansion wings -- perfected heating bar -- draftless ventilation -- full edge heating -- Celotex insulated Armco Metal construction -- full automatic controls. Order Now While Prices Are Low.

The CYCLONE MFG. CO., URBANA, IND.

NEW KIND OF PORTABLE MILKER

MEETS ALL INSPECTION REQUIREMENTS . . . . . PLUS!

FREE! Rush name for sensational facts and amazing low price on the Portable Milker that took 35 years to perfect. Information Free

Amazing 2-piece milk head cleaned CLEAN in a few seconds. Vacuum adjustable to each cow. No pulsator, no pipelines. NEW Lip Action Valve that can't stick or foul. Result of 35 years' experience. Nothing like old portables. Don't buy any milker until you get facts about the new

Anker-Holth

Anker-Holth Mfg. Co., Room M 11 Port Huron, Mich.

h. p. motor on the end and the wire connected to an electric system under constant pressure (115 volts). Turn off the motor switch. You still have pressure (voltage) but no electricity flowing. Turn on the motor and electricity flows. Squirt the electricity through a measuring instrument. The watts flowing is the rate of use. If you are buying the electricity you put a watt-hour meter in the circuit and you pay for the number of watt-hours passing through the meter.

Yes, you say but if I open the hose nozzle more, I will use more water.

Yes, I say, if you put a heavier load on the motor you will use more watt-hours.

But you asked about a kilowatt-hour, not a watt-hour. Well, you could measure the water in barrels instead of gallons. A kilowatt-hour is 1000 watt-hours.

Now, a 1 h. p. motor delivering just 1 h. p. should theoretically use 746 watts. But since about ¼ the power is lost in bearing friction, windage, wire heating, etc., it actually uses about 1000 watts (one kilowatt) or 1 kilowatt-hour in an hour. If only half loaded it would use about 0.6 kilowatt-hours in an hour; if running without load, possibly 0.2 kilowatt-hours in an hour. The ¼ h. p. motor when fully loaded will use about 0.33 kilowatt-hours in an hour. It is less efficient than a 1 h. p. motor. Watch our series of articles on motors for further information. The wattage marked on a lamp or appliance indicates the rate at which that lamp or appliance will use electricity. A 40 watt lamp will use 1 kilowatt-hour in 25 hours; a 60 watt in 16 2/3 hours; a 100 watt in 10 hours, and a 250 watt in 4 hours.

Tank Heater

Question: *I have a 100-gallon metal water trough outside that I bank with manure and cover with hinged doors. This usually freezes in the winter. Would a poultry water warmer such as the Trumbull keep this from freezing?*

S. E. C., New York

Answer: The Trumbull poultry water warmer is intended for use in only small quantities of water, and would not be suitable for a tank of 100 gallons capacity. You would need from 500 to 1500 watts in your tank, depending upon how you applied the heater.

New Publications

How to Make Slip Covers. Homemakers' Bul. 415, Cornell University, Ithaca, N. Y. 88 pages, 54 illus.

Grass Silage. 16 pages, 4 illus. Extension Bul. 409. Cornell University, Ithaca, N. Y.

General Catalog No. 40. Atlas Shop Equipment for 1940. 72 pages. Lathes, grinders, shapers, drills, presses. Atlas Press Co., Kalamazoo, Mich.

Electricity and Plant Growth. General Electric Co., Schenectady, N. Y. No. GEA-1644F. 8 pages, many illus. Pointed and specific information on soil heating, soil sterilization, plant

INSIST ON FLAIL-ACTION GIVES YOU 2 WAY GRINDING

AMAZING CAPACITY

Send for FREE catalog on most sensational hammer mill of all. Hammers beat DOWN—grinds all grains—roughage—faster, easier, at lower cost—amazing capacity.

STOVER *FLAIL-ACTION* FEED MASTER

—will grind your feed as you want it. Gives you 2 way grinding. Also acts as grain elevator. Leads all others—yet costs no more. Ask your Oliver dealer for demonstration. Easy terms. Send for Free Catalog today.

A Size for Every Motor

Stover Mfg. & Engine Co. 101 Lee St., FREEPORT, ILL.

CHURN WITHOUT TURNING A HAND!

GET MORE BUTTER *FASTER EASIER* WITH DAZEY ELECTRIC

● All the features that have made DAZEY hand churn famous for generations made still more efficient by POWER. Unbelievable savings of time and labor. Priced remarkably low. Sold wherever there are rural power lines. Write us for particulars.

DAZEY CHURN & MFG. CO., Dept. A-184, St. Louis, Mo

DAZEY ELECTRIC CHURNS

lighting, flood and garden lighting. Methods, equipment, prices.

SOUTH BEND LATHE CATALOG. South Bend, Ind. 112 pages, 250 illus. Metal working lathes of all types and sizes.

FARM HELP FROM THE HIGH LINE. 20 pages, profusely illustrated, concise information on farm and home uses for electricity. Westinghouse Elec. & Mfg. Co., Mansfield, Ohio. Booklet 837-A.

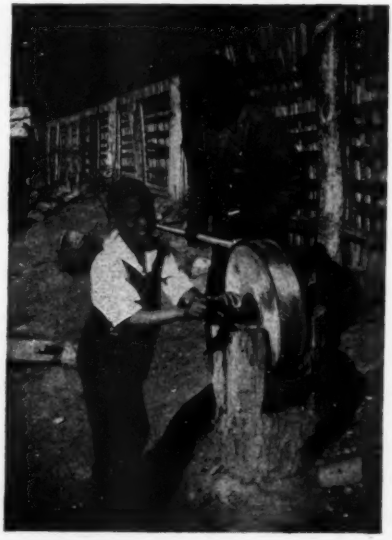
HOW TO BROOD CHICKS ELECTRICALLY. A 16 p. illustrated bulletin giving excellent information on how to get best results with electric brooders. National Ideal Co., Toledo, O.

CONCRETE FIRE CISTERNS. 6 pages. How to build cisterns to hold water for fighting farm fires. Portland Cement Asso., 33 W. Grand Ave., Chicago.

Electric Motors

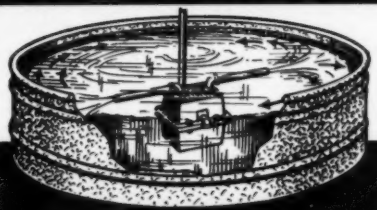
(*Here from page* 13)

phase type, with the addition of a capacitor or condenser which enables it to start much harder loads. There are several grades of capacitor type motors available, ranging from the home-workshop type which start loads from 1½ to 2 times as heavy as the split-phase, to the heavy-duty type which will start almost any type of load whatever. Capacitor motors are also more efficient than split-phase, using less watts per horsepower. The amperage consumed *while starting* is about half that of the split-phase type. Capacitor motors can be made in any size but are commonly used only in sizes up to ½ hp.



Wireless 1/40 h.p. split-face, motor. Finish: black. Made in North Carolina. Portable; versatile; self-starting. Different from all others: it not only hums, but it grins.

Electric AUTOMATIC STOCK TANK HEATER



30 Days Free Trial

A tested, proven invention that keeps stock tanks ice-free in coldest weather: provides warm stock water all winter without effort or attention. ENTIRELY AUTOMATIC: completely safe; dependable; more efficient than coal, wood or oil; economical to operate. FREE booklet tells all about PARAMOUNT heater and how it increases winter livestock profits.

WRITE FOR Free BOOKLET

FARM EQUIPMENT CO.
1422 WABASH KANSAS CITY, MO.

Nearly 1000 Farmers CAN'T BE WRONG!

During 1939 alone nearly 1,000 farmers found out how to grind their own feed for 10 CENTS A TON! They bought VIKING RED TORNADO HAMMER MILLS. You, too, can own one of these amazing mills and pay for it as you grind your feed. The RED TORNADO actually pays for itself in a short time. Grind wheat, corn, oats, barley, roughage, etc., as you want it. PAY $5 DOWN! USE MILL 30 DAYS AT OUR EXPENSE! REQUIRES NO ATTENTION. Works from 110 or 220 volt outlet. Special ½ H.P. motor swings hammer with tornado force. "I would not do without it for much more than it cost me," says Chas. Stipp, Elwood, Ind. JUST TRY IT YOURSELF. PAY ONLY $5 DOWN. USE MILL 30 DAYS AT OUR RISK.
Price and terms easy. Send no money now. Write for details.
VIKING MFG. CO., DEPT. 38, JACKSON, MICH.

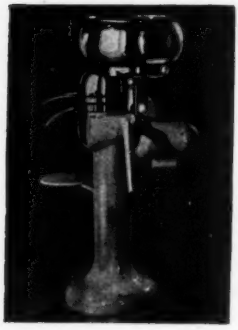
MAKOMB ELECT-O-STAT
A GREAT ELECTRIC SINCE 1929
USES LESS CURRENT

Approved by the Underwriters
Scientifically correct, with electric fan three-way air diffusion that cuts current cost 30 to 40%. Edge to edge silvered insulation. Head room for big founts. Bright gleaming 36-inch concave reflectors. Dual elements for safety. Steep, rigid canopy stays clean. 19-inch vent tube cuts heat loss. No room too cold. Write for folder on these sensational brooders.
THE MAKOMB LINE 104 MADISON AVENUE MACOMB, ILLINOIS
World's Largest Manufacturer of Brooders

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request to What's New Department, ELECTRICITY ON THE FARM, *24 West 40th Street, New York, N. Y.*

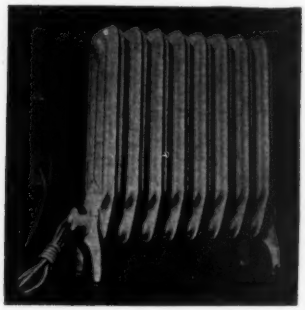
Separator-Standardizer

The illustration shows a new streamlined, easy-to-keep-clean separator with enclosed, build-in capacitor motor. All parts of the separator which come in contact with the milk may be had in stainless steel which is rustless and easy to keep clean. Special features of the machine are adjustments which make it easy to remove a small amount of skim milk in order to bring the remainder to standard butter-fat content, or to produce a 65 to 75 per cent cream which will congeal when cooled to 55° and may be salted and worked like butter or flavored with honey, maple or fruit syrups and used for dessert.



Electric Steam Radiator

A new, safe, clean method for heating bedrooms, bathrooms, spare rooms, brooder houses or any small space equipped with an electric outlet. Made of steel with baked enamel finish. Size 23 by 22 by 7½ inches; weight 40 lbs. Water capacity of internal boiler 2 qts; power used 900 watts, 110 v, A. C. or D. C.; 18½ sq. ft. steam radiation; automatic pressure release; carrying handle; rubber cushioned mar-proof sliders. Approved by Underwriters. Price $29.50 f. o. b. Detroit.



Heating Pad—3 Heats

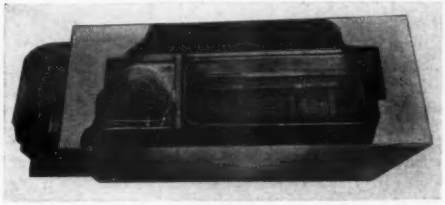
This heating pad is wired to give three different heats. It also has the unique feature of having tapes attached so the pad may be tied around an arm or leg, or fastened to the body.

Germicidal Lamps

Three new ultra-violet lamps for killing harmful bacteria have recently been placed on the market. One uses 3 watts, one 5 watts and one 15 watts. The 5 watt lamp is used on 110 volts; the others require auxiliary equipment. These lamps are all intended primarily for killing germs in the air. These lamps do not provide the ultra-violet which is beneficial to hens and humans. The rays are destructive. They are used in hospital rooms, refrigerators, meat curing rooms, etc.

Quick Freezing and Storage Cabinet

A New York company has two combination freezing and storage cabinets on the market. Each has a freezing compartment of 2½ cu.ft. and



frozen food storage capacities of 9½ and 17½ cu.ft. Prices complete $494.50 and $614.50 f.o.b. factory. Special features: Adjustable freezing temps. 0° to —15° F. Compartment may be used for zero storage when not needed for freezing. Fan circulation for quick freezing. Hermetically sealed corkboard insulation. Freezing compartment may be defrosted without affecting storage compartment. Illustration shows circular freezing compartment and sliding sanitary trays in storage compartment.

Twin-Cylinder Paint Sprayer

A new paint spray outfit which needs no oil and delivers up to 4 cu. ft. of air per minute at pressures up to 40 lbs. is now available at prices from $28.00 to $34.50 without motor. Bearings grease packed and sealed, V cylinders, white brass air castings, V-belt drive. For heavier service than single cylinder units.

CLASSIFIED ADVERTISING

MONEY SAVING ELECTRICAL FARM SUPPLIES. Fan-ventilated brooders for turkeys, chickens and game birds. PROVEN LINE of Burglar and Fire Alarms. Complete stock of materials and plans for home-made equipment. LYON ELECTRIC BROODERS are raising husky chicks and poults in all 48 states. Free CATALOG of complete money-saving LYON line. Write today. LYON ELECTRIC COMPANY, Dept. EF, San Diego, California.

GET YOUR FREE COPY NOW. Bussey 80-page book for Poultrymen. Low Factory Prices. Parts for electric brooders and batteries; heating assemblies; wire Fabrics; Poultry Department. Save money. BUSSEY PEN PRODUCTS CO., 5151 West 65th St., Chicago.

BUY YOUR ELECTRICAL POULTRY equipment from Brower for chickens, turkeys, pheasants, quail. Electric Brooders, Waterers, electric heating units, lighting switches. Also hammermills and feed mixers. World's largest line—425 items. Write for catalog—30 day trial and easy payment plan. BROWER MFG. CO., Dept. N-50, Quincy, Ill.

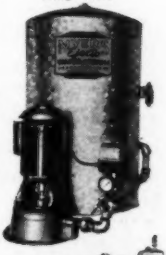
Satisfaction DELIVERED *at the* FAUCET..

with a MYERS Water System!

RUNNING WATER is *supplied* by a water system, but *delivered* through FAUCETS—in kitchen, bathroom and laundry—at outside hose taps—in barnyard and outbuildings. The final test of water system SATISFACTION is the rate of flow you get *at those faucets.* Sufficient CAPACITY in a water system is just as important as sound construction. The lack of *either* will seriously reduce the pleasure, profit and protection that running water can bring you. When you install an adequate, precision-built MYERS Water System, you can *always* depend on a good full stream—whether water is being drawn from only one faucet or from several different faucets at the same time.

Automatic, Self-Oiling Shallow Well

Ejecto Automatic Deep Well



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